

ABSTRACT

For efficiently manufacturing half-tone phase shifting mask blanks having uniform product qualities, which enables the prevention of optical property variations when the blanks are mass-produced, there is provided a process for manufacturing half-tone phase shifting mask blanks each having a phase shifting film containing at least one half-tone film on a transparent substrate, comprising the step of providing a target containing a metal and silicon, and carrying out reactive sputtering in an atmosphere containing a reactive gas, to form said half-tone film on said transparent substrate, wherein the formation of the half-tone film by said reactive sputtering is carried out using, as said target, a target having a metal/silicon compositional ratio selected so as to give a predetermined optical property of the half-tone film, at a reactive gas flow rate selected from a region where a discharge characteristic is stabilized against a change in the flow rate of the reactive gas.